CODE LETTERS FOR PROGRESS REPORT 97
CONTINUOUS EVALUATION OF CORRUGATING MEDIUM, PROJECT 1108-17

Company - Mill	Machine No.	Code Letter
The Chesapeake Corporation--West Point	1	--
Continental Can Company, Inc.--Hopewell	1	L
--Hodge	1	K
Crown Zellerbach Corporation--Baltimore	1	H
--Baltimore	2	I
--Bogalusa	4	M
--Lebanon	1	--
--Lebanon	2	J
International Paper Company--Arecibo	F	F
--Bastrop	1	L
--Bastrop	2	X
--Georgetown	1	C
The Mead Corporation--Harriman	1	B
--Knoxville	1	G
--Lynchburg	2	N
--Sylva	1	D
Olin Mathieson Chemical Corporation--Monroe	1	--
--Monroe	2	--
Owens-Illinois Glass Company--Big Island	3	O
--Tomahawk	1	P
-- Tomahawk	2	Q
--Tomahawk	3	S
Packaging Corporation of America--Filer City	1	R
--Filer City	2	T
St. Joe Paper Company--Port St. Joe	1	U
St. Regis Container Corporation Mill Division--Coshocton	1	--
Union Bag-Camp Paper Corporation--Savannah	2	A
West Virginia Pulp and Paper Company--Covington	6	V
--Covington	7	--
--Charleston	--	--
Weyerhaeuser Company North Carolina Division--Plymouth	3	W

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

Project 1108-17

Report 97

A Progress Report

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

October 1, 1962

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THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

INTRODUCTION

As requested by the Technical Committee of the Fourdrinier Kraft Board Institute, Inc., the reports pertinent to the continuous evaluation of corrugating medium are prepared by The Institute of Paper Chemistry on a bimonthly basis instead of the previous monthly basis. This system was initiated on August 1, 1961. This seventh report under the bimonthly system presents results obtained during the months of August and September, 1962.

During this seventh bimonthly period, 170 rolls of corrugating medium representing the production of twenty-four machines were evaluated. A tabulation of the number of rolls submitted from each machine during the months of August and September, 1962, is given in Table I. In connection with the data given in Table I, it should be mentioned that, effective September 1, 1961, at the request of the Technical Committee, the limit on the number of rolls submitted for evaluation from each machine during a given month was reduced from six to four.

Each sample of corrugating medium was evaluated for basis weight, caliper, Concora flat crush (conditioned after fluting), H. and D. flat crush on single-faced board, and runnability. Runnability was measured by corrugating each roll under standardized conditions on the Institute's corrugator into A-flute board at 600 feet per minute with minimum tension. If unsatisfactory runnability occurred at this speed, the corrugator was slowed down in increments of 25 f.p.m. until satisfactory runnability was obtained--i.e., no ruptured flutes. If the medium fabricated satisfactorily at 600 f.p.m. with minimum tension, further runs were made at higher tensions to determine when cracking occurred. The higher tensions used were 0.5 lb. per inch, 1.0 lb. per inch, and 1.5 lb. per inch.

TABLE I

NUMBER OF ROLLS OF CORRUGATING MEDIUM SUBMITTED
FOR EVALUATION FROM EACH MACHINE

August and September, 1962

Machine Code	Number of Rolls
A	8
B	10
C	6
D	6
E	7
F	8
G	8
H	8
I	8
J	12
K	2
L	7
M	4
N	8
O	4
P	8
Q	8
R	8
S	8
T	8
U	4
V	5
W	7
X	8
Total	170

Flat crush was determined on the single-faced board obtained at a speed of 600 f.p.m. with minimum tension. The flat crush results, in addition to supplying information about quality, will provide data which may be useful in studying the relationship between Concora flat crush and combined board flat crush for each participant's medium.

For each participating machine, the current machine averages associated with the current period are shown for each test in Table II and presented graphically in Fig. 1 to 4. The current machine average is the average of the test results obtained on all rolls of corrugating medium evaluated from a given machine during the current period. In addition to showing the test data obtained for the various machines, Table II also presents the current F.K.I. averages, cumulative F.K.I. averages, and the F.K.I. indexes. The current F.K.I. average for each test is the average of the test results for all machines participating in the study during a given period. The cumulative F.K.I. average for each test is determined by averaging the results for the previous twelve-month period excluding the result for the current period. The F.K.I. index for each test is obtained as follows:

$$\frac{\text{current F.K.I. average}}{\text{cumulative F.K.I. average}} \times 100 = \text{F.K.I. index (\%)}$$

The F.K.I. index provides a ready means of comparing the current quality with previous results. An index greater than 100% indicates that current quality is higher than the average result for the previous twelve periods; an index below 100% indicates that current quality is lower than the average result for the previous twelve periods.

The test results obtained on the sample lots submitted from the production of individual machines during August and September, 1962, are shown in Tables III through XXVI for Machines A through X, respectively. The maximum,

TABLE II

SUMMARY OF CURRENT MACHINE AVERAGES
August and September, 1962

Mill Code	Basis Weight, lb.	Caliper, points	Concora Flat Crush, p.s.i.	Single-Face Flat Crush, p.s.i.
A	27.0	9.2	38.1	34.3
B	28.0	10.5	36.7	33.7
C	27.4	10.4	38.9	36.4
D	27.4	10.6	36.0	33.2
E	26.4	10.5	41.1	38.5
F	28.2	9.8	33.2	32.0
G	26.2	10.9	34.4	31.9
H	29.6	9.6	35.3	32.7
I	27.2	9.7	37.2	32.9
J	26.7	9.4	33.6	31.5
K	27.6	9.9	38.2	37.4
L	26.7	10.8	40.4	37.8
M	26.0	10.7	37.3	35.0
N	26.7	9.9	37.8	35.0
O	26.8	10.1	38.1	35.2
P	26.7	10.4	35.8	33.4
Q	27.0	10.4	38.6	35.1
R	26.5	10.6	34.1	31.8
S	27.2	10.3	36.4	33.5
T	26.8	9.8	36.5	33.4
U	27.8	9.1	32.7	31.3
V	26.9	10.2	37.4	34.8
W	27.1	10.1	38.8	36.7
X	26.2	10.4	40.2	36.8
Current F.K.I. Average	27.1	10.1	36.9	34.4
Cumulative F.K.I. Average	27.2	10.3	36.5	33.0
F.K.I. Index, %	99.6	98.7	101.3	104.1

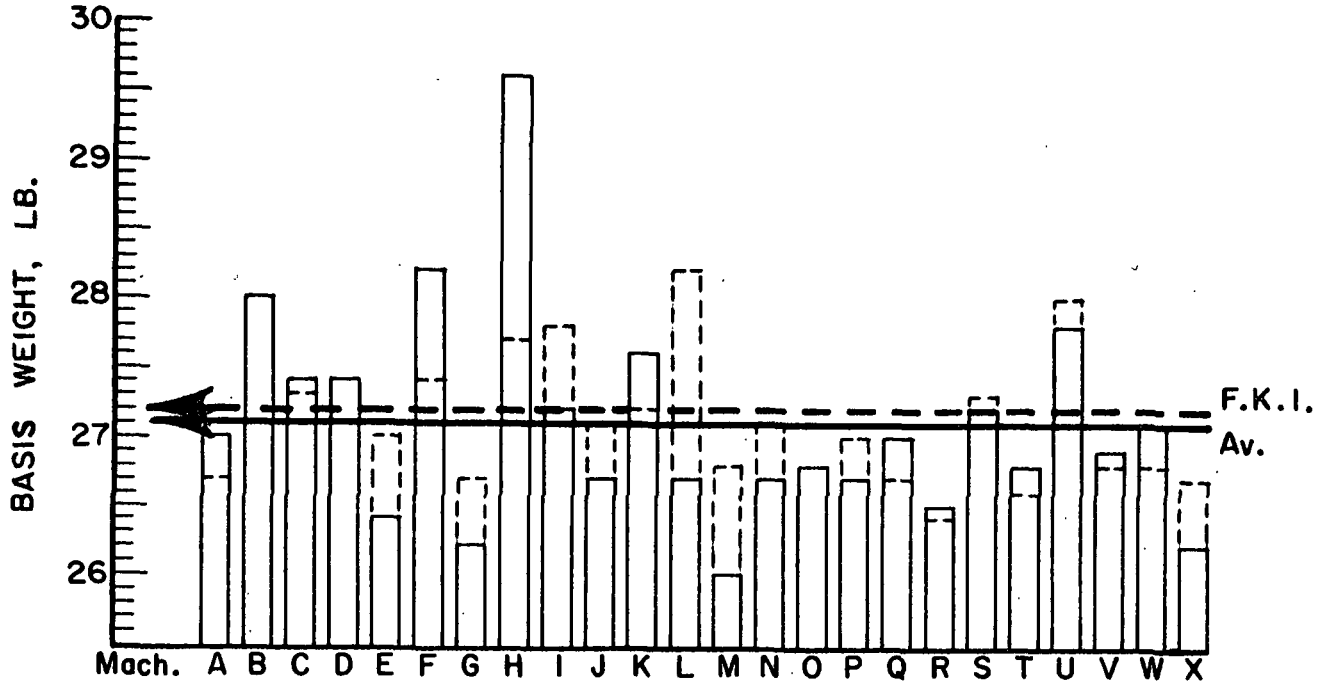

Figure 1. Comparison of Basis Weight Results

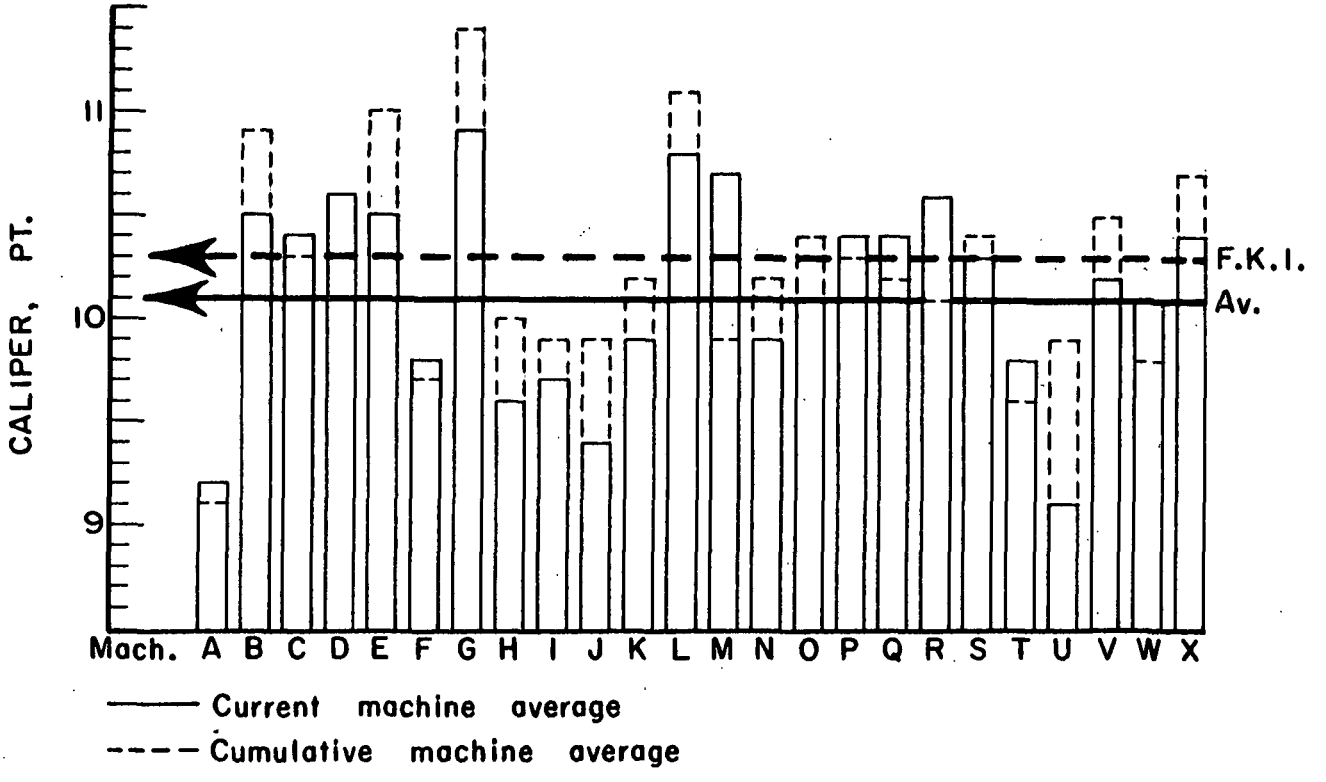

Figure 2. Comparison of Caliper Results

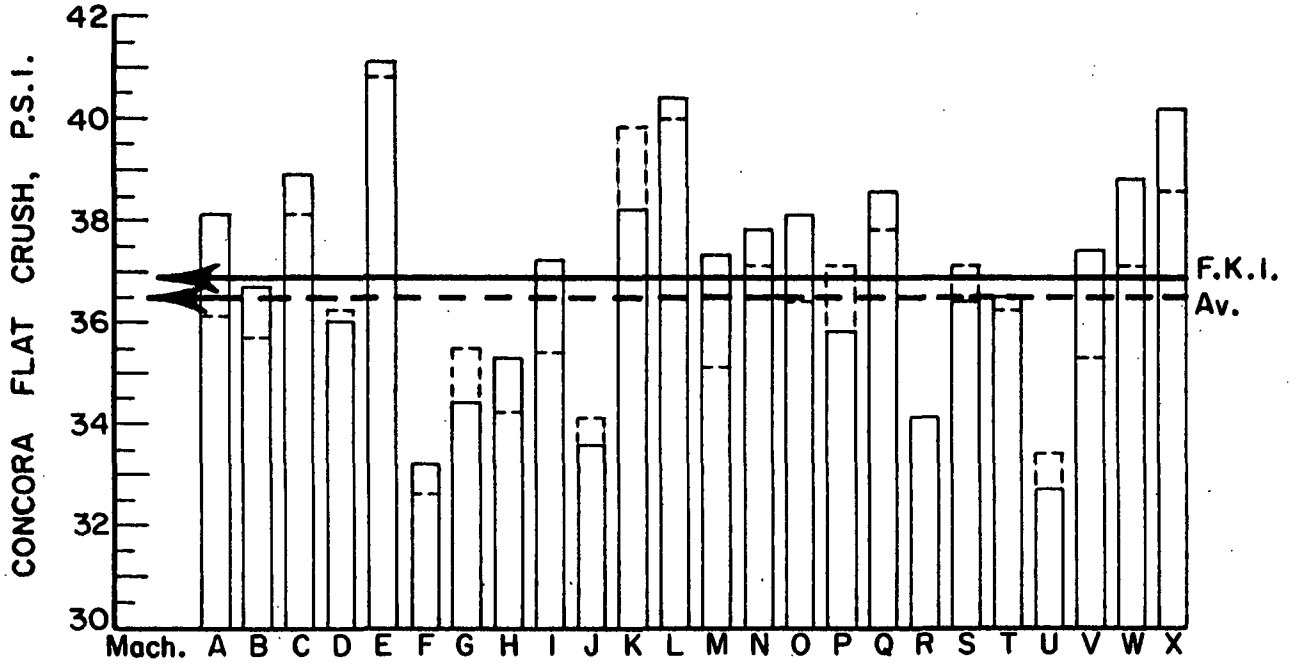

Figure 3. Comparison of Concora Flat Crush Results

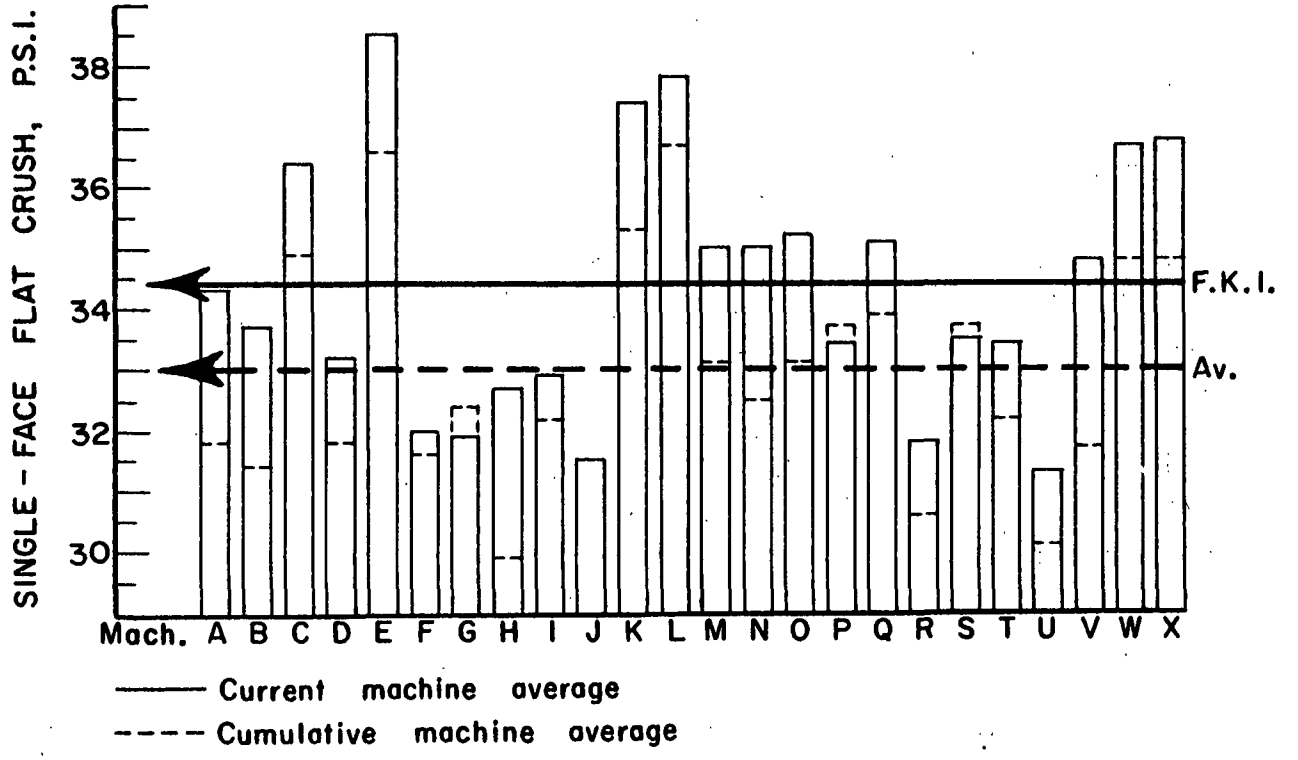

Figure 4. Comparison of Single-Face Flat Crush Results

TABLE III

SUMMARY OF TEST RESULTS FOR MACHINE A
August and September, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
A-1	7-20-62	7-27-62	504	27.8	9.9	9.0	9.4	40.2	37.8	38.8	36.6	31.6	34.7	Min.
A-2	7-22-62	8- 8-62	505	26.6	10.0	8.7	9.1	39.6	37.2	38.3	34.4	30.6	32.6	Min.
A-3	8- 2-62	8-13-62	506	27.0	9.5	9.0	9.2	41.4	38.4	40.1	37.0	35.6	36.4	1
A-4	8- 3-62	8-13-62	507	26.3	9.3	8.9	9.1	39.0	34.8	36.4	34.2	31.8	32.6	1-1/2
A-5	8- 5-62	8-17-62	508	27.0	9.1	9.0	9.0	40.2	36.0	37.8	36.8	35.2	36.3	1-1/2
A-6	9- 7-62	9-19-62	509	26.5	9.8	9.1	9.3	38.4	34.2	36.2	33.6	31.4	32.4	1-1/2
A-7	9- 9-62	9-19-62	510	27.8	9.8	9.2	9.4	41.4	39.0	39.6	38.2	35.6	37.0	1/2
A-8	9-11-62	9-21-62	511	26.7	9.8	9.0	9.4	39.0	36.6	37.8	34.8	31.0	32.6	1
Current Machine Average				27.0			9.2			38.1			34.3	
Cumulative Machine Average				26.7			9.1			36.1			31.8	
Machine Factor, %				101.0			101.1			105.7			108.0	
Machine Index, %				99.0			89.8			104.5			104.1	

TABLE IV

SUMMARY OF TEST RESULTS FOR MACHINE B
August and September, 1962

B-1	7-20-62	7-27-62	761	28.4	11.2	10.7	10.9	36.0	33.6	34.7	34.2	33.0	33.7	1-1/2
B-2	7-20-62	7-27-62	762	27.7	11.3	10.4	10.9	37.2	32.4	34.4	35.2	31.6	33.3	1
B-3	8- 2-62	8-13-62	769	29.2	11.0	10.4	10.7	39.6	34.8	37.6	33.0	31.0	32.2	1
B-4	8- 2-62	8-13-62	770	26.8	11.0	10.2	10.7	40.2	33.0	36.7	32.2	30.0	31.3	1
B-5	8-16-62	8-23-62	777	28.3	10.6	10.2	10.3	39.6	36.0	37.6	37.4	34.6	36.3	1
B-6	8-16-62	8-23-62	778	28.0	10.6	10.0	10.2	39.6	34.8	38.2	38.6	37.4	38.1	1
B-7	9-10-62	9-20-62	785	27.9	11.0	10.2	10.7	40.8	35.4	38.2	34.4	30.6	32.7	1-1/2
B-8	9-10-62	9-20-62	786	28.6	10.3	10.0	10.1	38.4	34.2	36.2	34.6	31.8	33.2	1-1/2
B-9	9-12-62	9-21-62	794	28.0	11.0	10.3	10.7	41.4	34.2	37.8	35.0	33.6	34.2	1-1/2
B-10	9-12-62	9-21-62	795	27.4	10.3	9.8	10.1	37.8	34.8	36.1	33.6	30.6	31.7	1-1/2
Current Machine Average				28.0			10.5			36.7			33.7	
Cumulative Machine Average				28.0			10.9			35.7			31.4	
Machine Factor, %				100.0			96.7			103.0			107.1	
Machine Index, %				103.0			102.6			100.7			102.1	

TABLE V

SUMMARY OF TEST RESULTS FOR MACHINE C
August and September, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
C-1	7-16-62	7-30-62	502	27.4	10.2	10.0	10.1	45.0	37.8	41.8	42.4	35.8	38.5	1/2
C-2	7-21-62	8- 8-62	503	27.4	10.9	10.0	10.4	39.0	35.4	37.3	38.4	34.2	35.7	1-1/2
C-3	8- 9-62	9- 5-62	504	26.2	10.5	9.8	10.0	37.2	33.0	34.9	39.6	35.0	36.8	1-1/2
C-4	8-16-62	9-17-62	505	27.4	10.8	10.0	10.4	42.0	35.4	39.2	35.8	33.4	34.9	1
C-5	8-22-62	9-17-62	506	27.9	10.9	10.2	10.5	40.8	37.8	39.1	39.0	35.6	37.5	1/2
C-6	8-22-62	9-17-62	507	27.8	11.0	10.2	10.6	43.8	38.4	40.8	35.2	33.4	34.8	Min.
Current Machine Average				27.4			10.4			38.9			36.4	
Cumulative Machine Average				27.3			10.3			38.1			34.9	
Machine Factor, %				100.3			100.2			102.1			104.3	
Machine Index, %				100.5			100.7			106.5			110.3	

TABLE VI

SUMMARY OF TEST RESULTS FOR MACHINE D
August and September, 1962

D-1	7-25-62	7-30-62	767	28.7	11.2	11.0	11.1	40.2	34.8	38.0	36.0	34.4	35.3	1-1/2
D-2	7-25-62	7-30-62	768	28.4	11.3	11.0	11.1	43.2	37.8	40.0	36.2	32.6	34.2	1-1/2
D-3	8- 8-62	8-21-62	775	27.0	10.8	10.2	10.5	35.4	31.8	33.8	34.8	31.6	33.3	1-1/2
D-4	8- 8-62	8-21-62	776	27.0	11.0	10.5	10.8	36.0	33.6	34.9	34.6	31.2	32.4	1-1/2
D-5	8-23-62	8-29-62	783	26.9	10.3	9.8	10.1	37.2	31.8	35.0	35.4	31.0	33.6	1-1/2
D-6	8-23-62	8-30-62	784	26.2	10.5	10.0	10.2	36.6	32.4	34.4	31.6	28.4	30.2	1-1/2
Current Machine Average				27.4			10.6			36.0			33.2	
Cumulative Machine Average				27.4			10.6			36.2			31.8	
Machine Factor, %				100.0			100.0			99.4			104.5	
Machine Index, %				100.6			103.5			98.8			100.6	

TABLE VII

SUMMARY OF TEST RESULTS FOR MACHINE E
August and September, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
E-1	7-25-62	8- 2-62	669	25.4	10.9	10.0	10.4	46.2	43.2	44.4	42.2	38.8	40.6	1-1/2
E-2	7-31-62	8-10-62	670	26.6	10.3	10.0	10.2	46.2	39.6	42.6	41.6	39.4	40.6	1-1/2
E-3	8- 8-62	8-14-62	671	27.1	11.1	10.9	11.0	44.4	39.0	42.0	39.4	36.6	37.8	1-1/2
E-4	8-14-62	8-29-62	672	26.5	10.8	10.0	10.3	44.4	41.4	43.0	40.8	35.4	38.7	1-1/2
E-5	8-24-62	8-30-62	673	26.0	11.0	10.1	10.6	39.0	35.4	37.4	36.8	35.4	36.3	1-1/2
E-6	8-31-62	9-10-62	674	26.7	11.0	10.0	10.6	42.6	36.0	38.8	38.4	36.6	37.4	1-1/2
E-7	9- 4-62	9-11-62	675	26.8	11.0	10.0	10.4	42.6	37.2	39.5	40.0	36.8	38.3	1
Current Machine Average				26.4			10.5			41.1			38.5	
Cumulative Machine Average				27.0			11.0			40.8			36.6	
Machine Factor, %				97.8			95.7			100.7			105.3	
Machine Index, %				97.2			102.2			112.6			116.8	

TABLE VIII

SUMMARY OF TEST RESULTS FOR MACHINE F
August and September, 1962

F-1	7-10-62	8-20-62	70	27.4	10.0	9.6	9.8	34.2	30.0	31.8	30.6	27.6	29.7	1-1/2
F-2	7-12-62	8-20-62	71	27.2	10.3	9.8	10.1	33.0	28.8	30.5	30.4	29.2	29.8	1/2
F-3	7-16-62	8-20-62	72	27.9	10.8	10.0	10.5	32.4	30.0	31.3	32.4	31.4	32.0	1/2
F-4	7-19-62	8-20-62	73	28.9	10.2	9.3	9.8	35.4	33.6	34.2	34.8	30.4	33.0	1
F-5	8- 6-62	9-17-62	74	29.1	10.1	9.3	9.8	36.6	34.2	35.5	34.4	31.0	32.9	1-1/2
F-6	8-15-62	9-17-62	75	29.1	10.0	9.0	9.4	39.6	34.2	36.6	36.4	34.6	35.9	1
F-7	8-21-62	9-17-62	76	27.7	9.8	8.9	9.3	32.4	30.0	31.7	31.2	28.0	29.6	1/2
F-8	8-23-62	9-17-62	77	28.8	10.2	9.2	9.7	34.8	32.4	33.7	35.0	31.4	32.7	1/2
Current Machine Average				28.2			9.8			33.2			32.0	
Cumulative Machine Average				27.4			9.7			32.6			31.6	
Machine Factor, %				103.0			101.4			101.6			101.3	
Machine Index, %				103.6			95.3			90.9			96.9	

TABLE IX

SUMMARY OF TEST RESULTS FOR MACHINE G
August and September, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
G-1	7-26-62	8- 2-62	763	25.2	10.9	9.0	10.0	34.2	33.0	33.7	34.6	30.2	31.6	1-1/2
G-2	7-26-62	8- 2-62	764	26.2	11.0	9.0	10.1	40.2	34.2	36.7	35.0	33.8	34.5	1-1/2
G-3	8- 7-62	8-15-62	771	26.6	13.0	11.4	12.1	36.6	31.8	34.3	32.4	29.0	30.3	1
G-4	8- 7-62	8-15-62	772	26.3	12.5	11.0	11.9	33.0	31.8	32.3	30.4	27.4	29.4	1
G-5	8-13-62	8-21-62	779	27.0	12.2	9.5	11.1	34.2	30.0	31.6	31.2	29.2	30.0	1-1/2
G-6	8-13-62	8-21-62	780	25.6	13.2	9.5	11.0	40.2	31.8	35.9	36.2	32.4	33.8	1-1/2
G-7	9- 4-62	9-12-62	787	26.5	11.0	10.0	10.4	37.8	34.2	35.9	33.8	32.8	33.4	1
G-8	9- 4-62	9-12-62	788	26.4	11.1	10.0	10.7	36.0	33.0	34.4	33.0	32.0	32.4	1/2
Current Machine Average				26.2			10.9			34.4			31.9	
Cumulative Machine Average				26.7			11.4			35.5			32.4	
Machine Factor, %				98.1			95.6			96.9			98.6	
Machine Index, %				96.4			106.3			94.1			96.8	

TABLE X

SUMMARY OF TEST RESULTS FOR MACHINE H
August and September, 1962

H-1	7- 4-62	8- 3-62	--	30.6	10.3	9.1	9.9	40.2	34.8	38.3	35.2	32.0	33.6	1-1/2
H-2	7-12-62	8- 3-62	--	28.7	9.9	9.0	9.3	36.0	34.2	35.3	35.8	31.6	33.9	1-1/2
H-3	7-13-62	8- 3-62	--	30.5	10.1	9.8	10.0	42.0	34.2	37.7	36.0	28.0	32.1	1-1/2
H-4	7-14-62	8- 3-62	--	28.4	9.9	8.8	9.5	38.4	34.2	36.5	35.2	31.6	33.2	1-1/2
H-5	8-21-62	9- 7-62	142	29.8	10.0	9.1	9.6	34.2	31.2	33.2	33.4	31.2	32.1	1-1/2
H-6	8-21-62	9- 7-62	143	29.0	10.0	8.9	9.5	34.8	31.2	33.0	32.4	31.0	31.6	1-1/2
H-7	8-22-62	9- 7-62	144	29.1	10.0	9.3	9.6	36.0	33.6	34.8	33.8	31.4	32.6	1-1/2
H-8	8-22-62	9- 7-62	145	30.6	9.9	9.2	9.6	34.8	30.6	33.5	33.6	31.6	32.7	1-1/2
Current Machine Average				29.6			9.6			35.3			32.7	
Cumulative Machine Average				27.7			10.0			34.2			29.9	
Machine Factor, %				106.9			96.6			103.2			109.6	
Machine Index, %				108.8			93.7			96.7			99.2	

TABLE XI

SUMMARY OF TEST RESULTS FOR MACHINE I
August and September, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runnability, maximum tension at 600 f.p.m., lb./in.
I-1	7-21-62	8- 3-62	141	28.1	10.9	10.0	10.2	41.4	34.8	38.5	37.0	31.8	34.9	1/2
I-2	7-21-62	8- 3-62	142	27.6	10.1	9.7	9.9	37.8	35.4	36.2	35.2	31.2	33.3	1
I-3	7-22-62	8- 3-62	143	27.4	10.5	9.2	9.9	38.4	35.4	36.6	31.4	29.0	30.5	1/2
I-4	7-22-62	8- 3-62	144	27.8	10.1	9.2	9.8	36.6	33.0	34.9	30.0	24.8	27.4	Min.
I-5	8-12-62	9- 7-62	145	27.1	9.8	9.0	9.4	40.2	35.4	38.4	36.2	33.0	34.8	1-1/2
I-6	8-13-62	9- 7-62	146	26.9	9.8	8.7	9.3	40.2	37.2	39.1	36.6	32.0	34.9	1/2
I-7	8-13-62	9- 7-62	147	26.7	10.0	9.0	9.6	40.2	34.8	37.4	35.8	32.6	34.1	1/2
I-8	8-12-62	9- 7-62	148	26.2	9.9	8.0	9.4	39.0	34.2	36.5	35.8	31.2	33.4	1/2
Current Machine Average				27.2			9.7			37.2			32.9	
Cumulative Machine Average				27.8			9.9			35.4			32.2	
Machine Factor, %				98.0			97.8			105.0			102.2	
Machine Index, %				100.0			94.3			102.0			99.8	

TABLE XII

SUMMARY OF TEST RESULTS FOR MACHINE J
August and September, 1962

J-1	7-18-62	8- 6-62	1	26.0	10.5	9.0	9.8	35.4	34.2	34.8	31.0	29.4	30.3	1-1/2
J-2	7-18-62	8- 6-62	2	28.2	10.2	9.9	10.0	43.2	38.4	40.3	38.9	34.8	36.4	1/2
J-3	7-18-62	8- 6-62	3	27.6	9.5	9.0	9.1	35.4	33.0	34.6	34.4	32.8	33.7	1/2
J-4	7-19-62	8- 6-62	4	27.0	9.9	9.0	9.4	38.4	33.0	35.2	34.8	32.4	33.4	--[a]
J-5	9- 6-62	9-20-62	I-1	27.2	10.0	9.1	9.5	37.8	33.6	36.1	32.0	30.0	30.8	1-1/2
J-6	9- 6-62	9-20-62	I-2	27.6	9.7	9.0	9.2	40.2	34.8	36.2	35.6	33.2	34.1	1-1/2
J-7	9- 6-62	9-20-62	I-3	25.6	9.1	8.3	8.9	34.8	30.6	33.1	32.4	29.2	30.8	1-1/2
J-8	9- 6-62	9-20-62	I-4	25.7	9.0	8.8	8.9	34.8	31.2	33.2	32.4	30.8	31.7	1-1/2
J-9	9- 7-62	9-20-62	I-3	26.2	10.0	9.0	9.6	36.0	28.8	31.4	31.6	29.8	30.8	1-1/2
J-10	9- 7-62	9-20-62	I-5	26.2	10.0	9.1	9.6	28.8	27.0	28.2	26.6	25.4	26.2	1-1/2
J-11	9-12-62	9-20-62	I-9	26.8	10.0	9.1	9.6	32.4	27.6	30.4	30.4	28.6	29.7	1-1/2
J-12	9-12-62	9-20-62	I-10	26.4	9.9	9.0	9.5	32.4	28.2	30.2	30.8	29.0	30.2	1-1/2
Current Machine Average				26.7			9.4			33.6			31.5	
Cumulative Machine Average				27.1			9.9			34.1			31.5	
Machine Factor, %				98.7			94.8			98.6			100.0	
Machine Index, %				98.1			91.7			92.2			95.6	

[a]Maximum speed at which this roll could be corrugated with minimum tension was 575 f.p.m.

TABLE XIII

SUMMARY OF TEST RESULTS FOR MACHINE K
August and September, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runnability, maximum tension at 600 f.p.m., lb./in.
K-1	5-22-62	8- 8-62	51	28.1	10.7	10.0	10.2	39.6	36.6	37.8	38.4	36.0	37.0	1-1/2
K-2	7-23-62	8- 8-62	56	27.1	9.9	9.0	9.5	42.0	35.4	38.6	38.6	37.4	37.9	1-1/2
Current Machine Average				27.6			9.9			38.2			37.4	
Cumulative Machine Average				27.2			10.2			39.8			35.3	
Machine Factor, %				101.5			97.2			96.1			106.0	
Machine Index, %				101.5			96.1			104.7			113.5	

TABLE XIV

SUMMARY OF TEST RESULTS FOR MACHINE L
August and September, 1962

L-1	7-24-62	8- 9-62	371	26.5	11.0	10.4	10.8	42.0	39.0	40.3	36.6	34.0	35.7	1-1/2
L-2	8- 1-62	8- 9-62	372	26.0	10.9	10.0	10.5	44.4	37.8	39.5	38.8	33.8	36.7	1-1/2
L-3	8- 7-62	8-21-62	373	26.2	10.9	10.2	10.5	40.8	37.8	39.1	40.2	37.6	38.5	1-1/2
L-4	8-14-62	8-21-62	374	26.7	11.2	10.8	10.9	40.8	38.4	39.2	40.0	37.0	38.4	1-1/2
L-5	8-27-62	9-10-62	375	26.0	11.0	10.7	10.9	40.2	34.8	37.4	36.2	35.0	35.4	1
L-6	9- 7-62	9-24-62	376	27.7	11.8	10.7	11.1	45.0	42.0	43.7	42.0	39.0	40.4	1-1/2
L-7	9-12-62	9-24-62	377	27.8	11.9	10.8	11.1	45.6	42.6	43.7	39.6	39.0	39.3	1-1/2
Current Machine Average				26.7			10.8			40.4			37.8	
Cumulative Machine Average				28.2			11.1			40.0			36.7	
Machine Factor, %				94.9			97.5			101.1			102.9	
Machine Index, %				98.1			105.4			110.8			114.5	

TABLE XV

SUMMARY OF TEST RESULTS FOR MACHINE M
August and September, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runnability, maximum tension at 600 f.p.m., lb./in.
M-1	8- 6-62	8-15-62	6	26.0	11.8	10.3	11.0	37.8	32.4	35.3	37.2	33.6	35.0	1
M-2	8- 9-62	8-20-62	7	26.7	11.5	10.3	10.9	45.0	40.8	43.2	38.4	36.6	37.7	1-1/2
M-3	8-12-62	8-27-62	8	25.7	12.0	10.3	11.5	39.0	32.4	35.3	35.0	31.6	32.9	1
M-4	8-23-62	8-30-62	9	25.8	9.8	9.0	9.2	36.6	34.8	35.4	35.6	33.4	34.5	1-1/2
Current Machine Average				26.0			10.7			37.3			35.0	
Cumulative Machine Average				26.8			9.9			35.1			33.1	
Machine Factor, %				97.2			107.7			106.3			105.7	
Machine Index, %				95.6			103.8			102.2			106.1	

TABLE XVI

SUMMARY OF TEST RESULTS FOR MACHINE N
August and September, 1962

N-1	7-26-62	8- 6-62	765	26.3	10.0	9.0	9.8	42.0	33.0	37.8	38.2	33.8	36.9	1-1/2
N-2	7-26-62	8- 6-62	766	27.6	10.2	9.8	10.0	43.2	37.8	40.9	40.2	38.6	39.3	1-1/2
N-3	8-10-62	8-20-62	773	25.7	10.0	9.5	9.8	40.2	37.2	38.5	36.6	32.0	33.7	1-1/2
N-4	8-10-62	8-20-62	774	25.4	9.9	9.2	9.6	39.0	34.8	37.2	36.0	30.4	34.0	1-1/2
N-5	8-28-62	9- 4-62	781	27.4	10.4	9.3	9.9	42.6	34.8	38.3	38.0	35.0	36.0	1-1/2
N-6	8-28-62	9- 4-62	782	27.4	10.3	9.7	10.0	43.2	37.2	40.6	37.4	34.6	36.2	1-1/2
N-7	9- 8-62	9-17-62	789	26.9	10.8	10.0	10.4	34.2	30.0	33.0	31.8	28.8	30.2	1-1/2
N-8	9- 8-62	9-17-62	790	27.4	10.3	9.9	10.0	37.8	32.4	35.9	36.2	32.2	33.9	1-1/2
Current Machine Average				26.7			9.9			37.8			35.0	
Cumulative Machine Average				27.1			10.2			37.1			32.5	
Machine Factor, %				98.7			97.7			101.7			108.0	
Machine Index, %				98.3			96.7			103.5			106.2	

TABLE XVII

SUMMARY OF TEST RESULTS FOR MACHINE O
August and September, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
O-1	7-15-62	8-29-62	3074	26.7	10.3	10.0	10.1	37.2	34.8	35.6	34.6	31.8	33.1	1-1/2
O-2	7-21-62	8-29-62	4205	26.9	10.8	10.1	10.3	39.6	38.4	38.8	37.2	36.0	36.6	1-1/2
O-3	8-21-62	9- 5-62	4593	27.3	10.0	9.9	10.0	39.0	37.2	38.3	36.4	34.8	35.6	1-1/2
O-4	8-24-62	9- 5-62	5097	26.3	10.5	9.5	9.9	41.4	37.8	39.6	37.4	34.0	35.4	1-1/2
Current Machine Average				26.8			10.1			38.1			35.2	
Cumulative Machine Average				26.8			10.4			36.4			33.1	
Machine Factor, %				100.0			96.8			104.5			106.2	
Machine Index, %				98.5			98.0			104.3			106.6	

TABLE XVIII

SUMMARY OF TEST RESULTS FOR MACHINE P
August and September, 1962

P-1	8- 2-62	8-15-62	--	27.1	10.3	9.8	10.0	39.0	32.4	35.5	34.8	33.2	34.2	1-1/2
P-2	8- 7-62	8-15-62	--	27.2	10.8	10.5	10.7	36.6	33.6	35.2	32.6	32.0	32.3	1-1/2
P-3	8-11-62	8-17-62	--	26.3	10.3	10.0	10.2	34.8	32.4	33.6	33.2	31.4	32.2	1
P-4	8-13-62	8-17-62	--	26.4	10.3	10.0	10.1	39.0	36.0	37.8	35.2	33.4	34.2	1-1/2
P-5	9- 9-62	9-14-62	--	26.8	10.8	10.2	10.5	38.4	33.6	36.6	34.8	32.8	33.8	1-1/2
P-6	9- 9-62	9-14-62	--	26.9	10.8	10.2	10.5	39.0	34.2	36.7	35.6	32.6	34.0	1
P-7	9-14-62	9-19-62	--	26.3	10.8	10.2	10.6	38.4	33.0	35.2	33.0	31.8	32.5	1-1/2
P-8	9-20-62	9-25-62	--	27.1	10.9	10.0	10.4	37.2	34.2	35.5	35.6	32.4	33.8	1-1/2
Current Machine Average				26.7			10.4			35.8			33.4	
Cumulative Machine Average				27.0			10.3			37.1			33.7	
Machine Factor, %				99.2			101.0			96.4			99.0	
Machine Index, %				98.3			100.8			98.0			101.2	

TABLE XIX

SUMMARY OF TEST RESULTS FOR MACHINE Q
August and September, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runnability, maximum tension at 600 f.p.m., lb./in.
Q-1	8- 3-62	8-15-62	--	27.0	10.2	9.9	10.0	42.6	35.4	40.2	36.8	35.4	36.2	1
Q-2	8- 9-62	8-15-62	--	26.7	10.4	10.0	10.2	38.4	34.8	37.1	34.6	33.0	34.0	1
Q-3	8-11-62	8-17-62	--	26.3	10.8	9.8	10.5	36.6	34.2	35.3	34.8	32.8	33.6	1
Q-4	8-16-62	8-22-62	--	26.7	10.5	10.0	10.2	38.4	35.4	36.5	35.8	32.0	33.8	1
Q-5	9- 6-62	9-14-62	--	27.7	11.3	11.0	11.1	41.4	39.6	40.4	36.6	34.6	35.4	1/2
Q-6	9- 8-62	9-14-62	--	27.8	11.0	10.6	10.8	40.2	37.8	39.1	38.0	34.6	36.1	1
Q-7	9- 9-62	9-14-62	--	26.8	11.0	10.2	10.4	42.6	38.4	40.4	38.2	35.8	37.2	1/2
Q-8	9-14-62	9-19-62	--	27.4	10.2	10.0	10.1	42.0	39.0	39.6	36.6	33.2	34.8	1-1/2
Current Machine Average				27.0			10.4			38.6			35.1	
Cumulative Machine Average				26.7			10.2			37.8			33.9	
Machine Factor, %				101.3			101.7			102.1			103.8	
Machine Index, %				99.4			101.3			105.7			106.5	

TABLE XX

SUMMARY OF TEST RESULTS FOR MACHINE R
August and September, 1962

R-1	7-31-62	8- 6-62	28	27.6	11.0	10.3	10.8	39.0	35.4	36.7	34.2	32.2	33.1	1-1/2
R-2	8- 4-62	8- 9-62	29	26.5	10.2	9.9	10.0	36.0	33.0	34.1	32.2	31.6	31.8	1-1/2
R-3	8-13-62	8-16-62	30	26.4	11.5	10.7	11.0	34.8	28.8	32.8	31.8	30.4	31.1	1-1/2
R-4	8-19-62	8-23-62	31	26.3	10.8	10.2	10.5	36.6	35.4	35.9	33.6	31.6	32.6	1-1/2
R-5	8-26-62	8-31-62	32	26.5	11.8	10.5	11.0	33.0	30.6	31.8	31.4	29.4	30.5	1-1/2
R-6	9- 6-62	9-11-62	33	25.7	10.2	9.9	10.0	36.0	33.0	34.4	33.4	31.0	32.2	1-1/2
R-7	9-10-62	9-17-62	34	26.5	10.9	10.2	10.6	36.6	31.8	34.4	33.4	31.0	32.4	1-1/2
R-8	9-18-62	9-21-62	35	26.7	11.8	11.1	11.3	34.8	31.2	33.0	31.6	29.4	30.4	1-1/2
Current Machine Average				26.5			10.6			34.1			31.8	
Cumulative Machine Average				26.4			10.1			34.1			30.6	
Machine Factor, %				100.6			105.5			100.0			103.8	
Machine Index, %				97.5			103.6			93.6			96.3	

TABLE XXI

SUMMARY OF TEST RESULTS FOR MACHINE S
August and September, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
S-1	8- 6-62	8-15-62	--	27.1	10.3	9.8	10.1	37.2	33.6	35.5	36.2	33.8	34.7	1-1/2
S-2	8- 9-62	8-15-62	--	27.5	10.8	10.3	10.6	40.8	34.8	38.5	34.8	31.8	33.2	1/2
S-3	8-10-62	8-15-62	--	27.3	10.5	10.0	10.2	37.8	32.4	35.5	34.6	32.8	33.6	1
S-4	8-17-62	8-22-62	--	26.7	10.5	10.0	10.2	36.0	32.4	34.6	35.4	30.6	33.5	1-1/2
S-5	9-10-62	9-14-62	--	27.2	10.8	9.8	10.2	39.6	36.0	37.4	34.6	30.8	32.8	1/2
S-6	9-14-62	9-19-62	--	27.2	10.8	10.0	10.4	37.8	34.2	36.5	34.4	32.4	33.5	1/2
S-7	9-17-62	9-25-62	--	27.0	10.8	10.1	10.4	37.8	35.4	36.7	35.6	33.4	34.2	1-1/2
S-8	9-18-62	9-25-62	--	27.5	11.0	10.2	10.5	37.8	35.4	36.5	34.8	30.0	32.4	1-1/2
Current Machine Average				27.2			10.3			36.4			33.5	
Cumulative Machine Average				27.3			10.4			37.1			33.7	
Machine Factor, %				99.5			99.8			98.1			99.5	
Machine Index, %				100.0			100.0			99.8			101.5	

TABLE XXII

SUMMARY OF TEST RESULTS FOR MACHINE T
August and September, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
T-1	7-31-62	8- 6-62	28	26.3	10.3	9.0	9.7	36.0	32.4	34.8	33.6	31.0	32.0	1-1/2
T-2	8- 4-62	8- 9-62	29	26.5	9.8	9.0	9.2	41.4	35.4	38.3	34.8	34.0	34.4	1-1/2
T-3	8-13-62	8-16-62	30	27.1	11.0	9.5	10.3	36.0	31.8	34.0	34.4	30.8	32.8	1-1/2
T-4	8-19-62	8-23-62	31	26.5	10.8	9.1	9.7	37.8	34.2	36.1	35.0	33.6	34.2	1-1/2
T-5	8-26-62	8-31-62	32	26.5	10.0	9.0	9.8	36.0	34.2	35.3	36.2	30.6	33.6	1-1/2
T-6	9- 6-62	9-11-62	33	26.8	10.0	9.0	9.5	37.8	34.8	37.1	35.0	32.8	34.0	1-1/2
T-7	9-10-62	9-17-62	34	27.3	10.2	9.2	9.8	41.4	36.0	39.6	35.4	31.8	33.6	1-1/2
T-8	9-17-62	9-21-62	35	27.1	10.9	10.0	10.5	38.4	33.6	37.0	33.6	31.4	33.0	1-1/2
Current Machine Average				26.8			9.8			36.5			33.4	
Cumulative Machine Average				26.6			9.6			36.2			32.2	
Machine Factor, %				100.5			102.4			100.8			103.9	
Machine Index, %				98.3			95.4			100.0			101.4	

TABLE XXIII

SUMMARY OF TEST RESULTS FOR MACHINE U
August and September, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runnability, maximum tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
U-1	8- 4-62	8-15-62	23	27.6	9.8	9.0	9.2	33.6	30.0	31.9	32.0	29.0	30.2	1/2
U-2	8- 4-62	8-16-62	24	27.2	9.2	8.5	8.9	32.4	29.4	30.5	31.6	29.4	30.2	1-1/2
U-3	8- 4-62	8-16-62	25	28.4	10.0	9.0	9.3	37.8	32.4	35.8	34.6	31.4	33.1	1-1/2
U-4	8- 4-62	8-16-62	26	27.9	9.5	9.0	9.1	36.6	31.2	32.6	34.0	29.8	31.6	1-1/2
Current Machine Average				27.8			9.1			32.7			31.3	
Cumulative Machine Average				28.0			9.9			33.4			30.1	
Machine Factor, %				99.2			92.8			98.0			103.9	
Machine Index, %				102.1			89.0			89.6			94.9	

TABLE XXIV

SUMMARY OF TEST RESULTS FOR MACHINE V
August and September, 1962

V-1	7-14-62	8-16-62	214	26.6	10.7	10.0	10.2	39.0	33.6	36.4	34.8	32.4	33.9	1-1/2
V-2	7-23-62	8-16-62	215	26.6	10.7	10.0	10.4	39.0	33.6	36.6	33.6	29.4	32.0	1-1/2
V-3	7-27-62	8-16-62	216	26.8	10.1	9.8	10.0	40.8	36.0	38.3	38.8	35.6	37.2	1-1/2
V-4	8- 7-62	8-16-62	217	26.9	10.6	9.4	9.9	40.2	35.4	37.0	35.8	34.0	34.8	1-1/2
V-5		9-17-62	218	27.5	10.9	9.9	10.4	41.4	37.2	39.0	37.4	34.6	36.4	1-1/2
Current Machine Average				26.9			10.2			37.4			34.8	
Cumulative Machine Average				26.8			10.5			35.3			31.7	
Machine Factor, %				100.2			97.3			106.0			109.8	
Machine Index, %				98.8			99.1			102.6			105.6	

TABLE XXV

SUMMARY OF TEST RESULTS FOR MACHINE W
August and September, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runnability, maximum tension at 600 f.p.m., lb./in.
W-1	7-19-62	8- 8-62	278	27.1	10.1	9.5	9.9	43.2	40.8	41.9	39.0	37.6	38.2	1-1/2
W-2	7-23-62	8- 8-62	413	27.6	10.1	9.0	9.7	42.6	36.0	39.4	36.4	33.0	34.4	Min.
W-3	7-30-62	9- 4-62	602	26.6	10.8	10.0	10.3	40.8	34.2	36.4	36.8	35.4	36.7	Min.
W-4	8- 3-62	9- 4-62	68	27.6	10.5	9.8	10.0	40.2	37.8	39.0	38.8	36.6	37.4	1-1/2
W-5	8- 9-62	9- 4-62	239	26.9	10.9	9.4	10.1	40.2	36.0	38.0	38.6	36.4	37.3	1
W-6	8-17-62	9-19-62	454	26.6	10.8	10.0	10.2	42.0	34.8	38.0	38.2	33.8	36.5	1
W-7	8-21-62	9-19-62	581	27.1	11.1	10.2	10.7	40.8	37.2	38.9	37.6	35.4	36.4	Min.
Current Machine Average				27.1			10.1			38.8			36.7	
Cumulative Machine Average				26.8			9.8			37.1			34.8	
Machine Factor, %				101.2			103.1			104.4			105.4	
Machine Index, %				99.5			98.5			106.3			111.2	

TABLE XXVI

SUMMARY OF TEST RESULTS FOR MACHINE X
August and September, 1962

Code	Date Made	Date Received	Mill Roll No.	Basis Weight, lb./M sq.ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runnability, maximum tension at 600 f.p.m., lb./in.
X-1	7-25-62	8- 2-62	321	26.0	10.9	10.0	10.2	44.4	41.4	42.7	40.8	37.4	38.6	1-1/2
X-2	7-31-62	8-10-62	322	26.0	10.9	10.0	10.3	42.6	39.0	40.8	37.6	36.0	36.8	1-1/2
X-3	8- 8-62	8-14-62	323	26.8	11.0	9.1	10.2	44.4	40.8	42.5	39.8	38.0	39.0	1-1/2
X-4	8-14-62	8-27-62	324	26.8	11.7	10.3	11.1	40.8	36.6	38.9	36.6	34.4	35.8	1-1/2
X-5	8-23-62	8-30-62	325	25.8	11.0	10.0	10.5	41.4	37.2	39.1	38.4	37.0	37.7	1-1/2
X-6	8-28-62	9- 7-62	326	25.4	10.2	9.5	9.9	41.4	35.4	39.4	36.8	36.0	36.4	1-1/2
X-7	9- 5-62	9-12-62	327	26.3	11.0	10.0	10.5	41.4	37.2	39.1	36.4	34.0	35.0	1-1/2
X-8	9-19-62	9-25-62	328	26.6	11.0	10.0	10.5	40.2	37.2	38.9	36.6	34.0	35.1	1-1/2
Current Machine Average				26.2			10.4			40.2			36.8	
Cumulative Machine Average				26.7			10.7			38.6			34.8	
Machine Factor, %				98.2			97.0			104.1			105.9	
Machine Index, %				96.3			101.1			110.1			111.6	

minimum, and average test results obtained on each sample lot are shown for all tests except basis weight for which only the average is shown; in addition the over-all average result for all sample lots submitted from a given machine is shown for each test. The latter over-all averages are reported as "current machine averages". A cumulative machine average is also shown and is calculated by averaging the current machine averages for the previous twelve periods (excluding the current period). Also shown for each machine in Tables III to XXVI are the machine factor and machine index which are defined as follows:

$$\frac{\text{current machine average}}{\text{cumulative machine average}} \times 100 = \text{machine factor (\%)}$$

$$\frac{\text{current machine average}}{\text{cumulative F.K.I. average}} \times 100 = \text{machine index (\%)}$$

The machine factor and machine index provide a means for comparing the current machine average with either the previous results for that particular machine or with the cumulative results for all machines--i.e., the cumulative F.K.I. average.

DISCUSSION OF RESULTS

Shown below from Table II are the maximum and minimum current machine averages noted for each test during the current period (August and September, 1962); the current machine average is the average of the results obtained on all rolls submitted from a given machine during the current period. Also given for each test is the current F.K.I. average which is determined by averaging the current machine averages for the current period and is indicative of the test level being maintained by the industry as a whole to the extent that the industry is represented by the participating machines:

	Maximum Current Machine Average	Minimum Current Machine Average	Current F.K.I. Average
Basis wt., lb.	29.6	26.0	27.1
Caliper, pt.	10.9	9.1	10.1
Concora flat crush, p.s.i.	41.1	32.7	36.9
Single-face flat crush, p.s.i.	38.5	31.3	34.4

The runnability data for the 170 rolls evaluated during the current period are summarized as follows:

Runnability	Number of Rolls	Percentage of Total Rolls
Less than 600 f.p.m. with minimum tension	1	0.6
600 f.p.m.--minimum tension	7	4.1
600 f.p.m.--1/2 lb. per in. tension	21	12.4
600 f.p.m.--1 lb. per in. tension	28	16.5
600 f.p.m.--1-1/2 lb. per in. tension	113	66.5

In Table XXVII a comparison of Institute and mill Concora flat crush test results obtained on conditioned specimens is given for each machine for the current period. The inclusion of these comparisons is made possible by the fact that interested participants submit their Concora flat crush test results to The Institute of Paper Chemistry. This affords each participant the opportunity to review the level of agreement for his data with the levels shown for the other participants. Data sheets for supplying this information may be obtained from the Institute. Comparisons of this kind are a helpful adjunct to other calibration procedures. Shown in Table XXVII are (1) the Institute and mill Concora averages for each roll included in these comparisons, (2) the difference between the roll average based on Institute data and that based on mill data, (3) the Institute and mill averages based on all rolls included in the comparison, and (4) the difference between these over-all averages.

The Concora flat crush data shown in Table XXVII are summarized in Part I of Table XXVIII where for each machine the following information is given: (1) Current machine average based on Institute data, (2) current machine average based on mill data, (3) the average difference--that is, the difference between the current machine average based on Institute data and that based on mill data and (4) the maximum difference encountered in comparing Institute and mill test averages for individual rolls. In Part II of Table XXVIII the average differences given in Part I have been converted to per cent. Comparative data from the previous two reports are also included in Part II of Table XXVIII. It may be seen in Part II of Table XXVIII that, for the current period, the highest average difference of 12.2% was associated with Machine I and the lowest of 0.6% with Machine G.

In Table XXIX a summary of the agreement between Institute and mill Concora flat crush data is given for the current period, and comparative data

TABLE XXVII

INSTITUTE AND MILL CONCORA FLAT CRUSH TEST RESULTS ON INDIVIDUAL ROLLS FOR AUGUST AND SEPTEMBER, 1962

Machine A						Machine B						Machine C					
			Concora Flat Crush, p.s.i.						Concora Flat Crush, p.s.i.						Concora Flat Crush, p.s.i.		
Code	Mill Roll No.	Date Made	Institute	Mill	Difference[a]	Code	Mill Roll No.	Date Made	Institute	Mill	Difference[a]	Code	Mill Roll No.	Date Made	Institute	Mill	Difference[a]
A-1	504	7-20-62	38.8	40.7	+1.9	B-1	761	7-20-62	34.7	30.7	-4.0	C-1	502	7-16-62	41.8	40.4	-1.4
A-2	505	7-22-62	38.3	39.0	+0.7	B-2	762	7-20-62	34.4	32.5	-1.9	C-2	503	7-21-62	37.3	40.4	+3.1
A-3	506	8- 2-62	40.1	42.3	+2.2	B-3	769	8- 2-62	37.6	36.5	-1.1	C-3	504	8- 9-62	34.9	38.0	+3.1
A-4	507	8- 3-62	36.4	38.4	+2.0	B-4	770	8- 2-62	36.7	32.8	-3.9	C-4	505	8-16-62	39.2	40.8	+1.6
A-5	508	8- 5-62	37.8	40.1	+2.3	B-5	777	8-16-62	37.6	38.4	+0.8	C-5	506	8-22-62	39.1	44.9	+5.8
A-6	509	9- 7-62	36.2	37.2	+1.0	B-6	778	8-16-62	38.2	40.8	+2.6	C-6	507	8-22-62	40.8	46.3	+5.5
A-7	510	9- 9-62	39.6	38.7	-0.9	B-7	785	9-10-62	38.2	37.3	-0.9						
A-8	511	9-11-62	37.8	39.0	+1.2	B-8	786	9-10-62	36.2	38.4	+2.2						
						B-9	794	9-12-62	37.8	39.1	+1.3						
						B-10	795	9-12-62	36.1	36.4	+0.3						
Current Machine Av.			38.1	39.4	+1.3	Current Machine Av.			36.7	36.3	-0.4	Current Machine Av.			38.9	41.8	+2.9

Machine D						Machine E						Machine F					
D-1	767	7-25-62	38.0	40.8	+2.8	E-1	669	7-25-62	44.4	41.8	-2.6	F-1	70	7-10-62	31.8	33.8	+2.0
D-2	768	7-25-62	40.0	38.9	-1.1	E-2	670	7-31-62	42.6	40.8	-1.8	F-2	71	7-12-62	30.5	34.2	+3.7
D-3	775	8- 8-62	33.8	35.3	+1.5	E-3	671	8- 8-62	42.0	41.0	-1.0	F-3	72	7-16-62	31.3	34.3	+3.0
D-4	776	8- 8-62	34.9	36.7	+1.8	E-4	672	8-14-62	43.0	42.7	-0.3	F-4	73	7-19-62	34.2	35.4	+1.2
D-5	783	8-23-62	35.0	35.9	+0.9	E-5	673	8-24-62	37.4	38.2	+0.8	F-5	74	8- 6-62	35.5	36.6	+1.1
D-6	784	8-23-62	34.4	33.5	-0.9	E-6	674	8-31-62	38.8	39.1	+0.3	F-6	75	8-15-62	36.6	37.7	+1.1
						E-7	675	9- 4-62	39.5	39.5	0.0	F-7	76	8-21-62	31.7	33.6	+1.9
												F-8	77	8-23-62	33.7	37.1	+3.4
Current Machine Av.			36.0	36.8	+0.8	Current Machine Av.			41.1	40.4	-0.7	Current Machine Av.			33.2	35.3	+2.1

Machine G						Machine H						Machine I					
G-1	763	7-26-62	33.7	31.9	-1.8	H-5	142	8-21-62	33.2	31.3	-1.9	I-5	145	8-12-62	38.4	30.2	-8.2
G-2	764	7-26-62	36.7	33.6	-3.1	H-6	143	8-21-62	33.0	31.3	-1.7	I-6	146	8-13-62	39.1	32.4	-6.7
G-3	771	8- 7-62	34.3	34.8	+0.5	H-7	144	8-22-62	34.8	32.0	-2.8	I-7	147	8-13-62	37.4	32.5	-4.9
G-4	772	8- 7-62	32.3	35.5	+3.2	H-8	145	8-22-62	33.5	34.5	+1.0	I-8	148	8-12-62	36.5	37.7	+1.2
G-5	779	8-13-62	31.6	32.6	+1.0												
G-6	780	8-13-62	35.9	32.6	-3.3												
G-7	787	9- 4-62	35.9	35.8	-0.1												
G-8	788	9- 4-62	34.4	37.0	+2.6												
Current Machine Av.			34.4	34.2	-0.2	Current Machine Av.			33.6	32.3	-1.3	Current Machine Av.			37.8	33.2	-4.6

[a]This difference is the amount in p.s.i. units by which the mill result is higher or lower than the Institute result.

TABLE XXVII (Continued)

INSTITUTE AND MILL CONCORA FLAT CRUSH TEST RESULTS ON INDIVIDUAL ROLLS FOR AUGUST AND SEPTEMBER, 1962

Machine L

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
L-1	371	7-24-62	40.3	33.7	-6.6
L-2	372	8- 1-62	39.5	36.8	-2.7
L-3	373	8- 7-62	39.1	34.7	-4.4
L-4	374	8-14-62	39.2	35.0	-4.2
L-5	375	8-27-62	37.4	34.8	-2.6
L-6	376	9- 7-62	43.7	38.5	-5.2
L-7	377	9-12-62	43.7	36.6	-7.1
Current Machine Av.			40.4	35.7	-4.7

Machine N

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
N-1	765	7-26-62	37.8	38.1	+0.3
N-2	766	7-26-62	40.9	39.7	-1.2
N-3	773	8-10-62	38.5	38.2	-0.3
N-4	774	8-10-62	37.2	38.5	+1.3
N-5	781	8-28-62	38.3	41.4	+3.1
N-6	782	8-28-62	40.6	40.5	-0.1
N-7	789	9- 8-62	33.0	36.6	+3.6
N-8	790	9- 8-62	35.9	37.8	+1.9
Current Machine Av.			37.8	38.8	+1.0

Machine O

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
O-1	3074	7-15-62	35.6	34.6	-1.0
O-2	4205	7-21-62	38.8	35.2	-3.6
O-3	4593	8-21-62	38.3	35.0	-3.3
O-4	5097	8-24-62	39.6	36.2	-3.4
Current Machine Av.			38.1	35.2	-2.9

Machine P

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
P-1	--	8- 2-62	35.5	36.2	+0.7
P-2	--	8- 7-62	35.2	37.8	+2.6
P-3	--	8-11-62	33.6	35.9	+2.3
P-4	--	8-13-62	37.8	37.2	-0.6
P-5	--	9- 9-62	36.6	35.6	-1.0
P-6	--	9- 9-62	36.7	36.0	-0.7
P-7	--	9-14-62	35.2	36.1	+0.9
P-8	--	9-20-62	35.5	36.5	+1.0
Current Machine Av.			35.8	36.4	+0.6

Machine Q

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
Q-1	--	8- 3-62	40.2	39.6	-0.6
Q-2	--	8- 9-62	37.1	36.7	-0.4
Q-3	--	8-11-62	35.3	36.2	+0.9
Q-4	--	8-16-62	36.5	37.3	+0.8
Q-5	--	9- 6-62	40.4	36.1	-4.3
Q-6	--	9- 8-62	39.1	37.9	-1.2
Q-7	--	9- 9-62	40.4	38.2	-2.2
Q-8	--	9-14-62	39.6	38.2	-1.4
Current Machine Av.			38.6	37.5	-1.1

Machine R

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
R-1	28	7-31-62	36.7	39.2	+2.5
R-2	29	8- 4-62	34.1	35.8	+1.7
R-3	30	8-13-62	32.8	33.8	+1.0
R-4	31	8-19-62	35.9	33.7	-2.2
R-5	32	8-26-62	31.8	33.1	+1.3
R-6	33	9- 6-62	34.4	35.9	+1.5
R-7	34	9-10-62	34.4	33.7	-0.7
R-8	35	9-18-62	33.0	32.7	-0.3
Current Machine Av.			34.1	34.7	+0.6

Machine S

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
S-1	--	8- 6-62	35.5	36.4	+0.9
S-2	--	8- 9-62	38.5	37.3	-1.2
S-3	--	8-10-62	35.5	35.3	-0.2
S-4	--	8-17-62	34.6	35.2	+0.6
S-5	--	9-10-62	37.4	36.7	-0.7
S-6	--	9-14-62	36.5	34.9	-1.6
S-7	--	9-17-62	36.7	35.8	-0.9
S-8	--	9-18-62	36.5	35.0	-1.5
Current Machine Av.			36.4	35.8	-0.6

Machine T

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
T-1	28	7-31-62	34.8	36.5	+1.7
T-2	29	8- 4-62	38.3	37.3	-1.0
T-3	30	8-13-62	34.0	34.7	+0.7
T-4	31	8-19-62	36.1	36.6	+0.5
T-5	32	8-26-62	35.3	36.1	+0.8
T-6	33	9- 6-62	37.1	39.4	+2.3
T-7	34	9-10-62	39.6	37.3	-2.3
T-8	35	9-17-62	37.0	36.7	-0.3
Current Machine Av.			36.5	36.8	+0.3

Machine U

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
U-1	23	8- 4-62	31.9	34.0	+2.1
U-2	24	8- 4-62	30.5	33.4	+2.9
U-3	25	8- 4-62	35.8	36.5	+0.7
U-4	26	8- 4-62	32.6	34.2	+1.6
Current Machine Av.			32.7	34.5	+1.8

Machine V

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
V-1	214	7-14-62	36.4	37.3	+0.9
V-2	215	7-23-62	36.6	36.4	-0.2
V-3	216	7-27-62	38.3	39.4	+1.1
V-4	217	8- 7-62	37.0	39.6	+2.6
Current Machine Av.			37.1	38.2	+1.1

Machine W

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
W-1	278	7-19-62	41.9	41.4	-0.5
W-2	413	7-23-62	39.4	43.4	+4.0
W-3	602	7-30-62	36.4	37.9	+1.5
W-4	68	8- 3-62	39.0	38.8	-0.2
W-5	239	8- 9-62	38.0	40.6	+2.6
W-6	454	8-17-62	38.0	37.4	-0.6
W-7	581	8-21-62	38.9	41.4	+2.5
Current Machine Av.			38.8	40.1	+1.3

Machine X

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
X-1	321	7-25-62	42.7	40.0	-2.7
X-2	322	7-31-62	40.8	39.0	-1.8
X-3	323	8- 8-62	42.5	42.4	-0.1
X-4	324	8-14-62	38.9	38.5	-0.4
X-5	325	8-23-62	39.1	37.4	-1.7
X-6	326	8-28-62	39.4	39.1	-0.3
X-7	327	9- 5-62	39.1	38.5	-0.6
X-8	328	9-19-62	38.9	39.1	+0.2
Current Machine Av.			40.2	39.2	-1.0

[a]This difference is the amount in p.s.i. units by which the mill result is higher or lower than the Institute result.

TABLE XXVIII

PART I: A COMPARATIVE SUMMARY FOR EACH MACHINE OF THE CONCORA FLAT CRUSH AVERAGES BASED ON INSTITUTE DATA AND THOSE BASED ON MILL DATA

Machine Code	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
Number of Rolls Compared	8	10	6	6	7	8	8	4	4	0	0	7	0	8	4	8	8	8	8	8	4	4	7	8
Concora Flat Crush, p.s.i.																								
Current Machine Av. (Institute)[a]	38.1	36.7	38.9	36.0	41.1	33.2	34.4	33.6	37.8	--	--	40.4	--	37.8	38.1	35.8	38.6	34.1	36.4	36.5	32.7	37.1	38.8	40.2
Current Machine Av. (Mill)[a]	39.4	36.3	41.8	36.8	40.4	35.3	34.2	32.3	33.2	--	--	35.7	--	38.8	35.2	36.4	37.5	34.7	35.8	36.8	34.5	38.2	40.1	39.2
Average Difference[b]	+1.3	-0.4	+2.9	+0.8	-0.7	+2.1	-0.2	-1.3	-4.6	--	--	-4.7	--	+1.0	-2.9	+0.6	-1.1	+0.6	-0.6	+0.3	+1.8	+1.1	+1.3	-1.0
Maximum Difference[c]	+2.3	-4.0	+5.8	+2.8	-2.6	+3.7	-3.3	-2.8	-8.2	--	--	-7.1	--	+3.6	-3.6	+2.6	-4.3	+2.5	-1.6	±2.3	+2.9	+2.6	+4.0	-2.7

PART II: A TABULATION FOR EACH MACHINE OF THE AVERAGE DIFFERENCE (PER CENT) BETWEEN THE CONCORA FLAT CRUSH BASED ON INSTITUTE DATA AND THAT BASED ON MILL DATA

Average Difference, %[d]																								
Current Report (August and September)	+3.4	-1.1	+7.5	+2.2	-1.7	+6.3	-0.6	-3.9	-12.2	--	--	-11.6	--	+2.6	-7.6	+1.7	-2.8	+1.8	-1.6	+0.8	+5.5	+3.0	+3.4	-2.5
96th Report (June and July)	+3.4	-3.4	+3.6	+6.9	-2.2	+8.2	+2.1	--	--	--	--	-3.4	--	+1.6	-5.1	+4.6	+0.5	+1.7	+4.3	+2.2	+4.0	+1.4	+5.0	+2.1
95th Report (April and May)	+2.1	-3.6	+3.9	--	+0.5	+11.7	-7.5	--	--	--	--	-0.8	--	+0.8	-6.6	-2.2	-0.8	+2.6	-0.5	+1.4	+0.9	+1.7	+3.5	+3.1

[a] Comparisons based on current machine average include only those rolls for which mill data were submitted.

[b] Average difference is the difference between the current machine average based on Institute test results and that based on mill test results with the Institute test results used as the reference. See Table XXVII.

[c] Maximum difference is the greatest difference encountered in comparing Institute and mill test averages for individual rolls. See Table XXVII.

[d] Average difference (per cent) is computed by dividing the average difference in p.s.i. (shown above in Part I of this table) by the Institute current machine average and multiplying the result by 100.

from the previous bimonthly period are also included. The data shown for the current period indicate that agreement between Institute and mill Concora data was good. It may be seen in Table XXIX that, for the current period, 9.5% of the comparisons of Institute and mill data differed by 1% or less, 42.9% of the comparisons differed by 2.5% or less, and 71.4% of the comparisons differed by 5% or less; agreement at the 1, 2.5 and 5% levels is comparable to the agreement for the previous period at these levels; however, agreement at the 5 and 10% levels for the current period is not quite as good as that noted for the previous period. Also, the maximum difference of 12.2% noted for the current period is somewhat higher than the maximum difference of 8.2% noted for the previous period.

TABLE XXIX

SUMMARY OF AGREEMENT BETWEEN INSTITUTE AND MILL
CONCORA FLAT CRUSH DATA

Average Percentage Difference Between Institute and Mill Concora Flat Crush Test Results[a]	Percentage of All Machines Included Within the Indicated Range	
	Previous Period[b]	Current Period[c]
± 1.0	5.3	9.5
± 2.5	42.1	42.9
± 5.0	84.2	71.4
±10.0	100.0[d]	90.5
±12.2		100.0

[a]The average obtained at the Institute was used as the reference in the calculation of the percentage differences.
[b]June and July, 1962.
[c]August and September, 1962.
[d]Maximum percentage difference was 8.2.

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